FY03 Facilities Assessment and Deferred Maintenance Estimate

November 4, 2003

Purpose

- To provide a consistent, auditable deferred maintenance (DM) cost estimate at the Agency and Center levels, and to provide an assessment of the general condition of NASA facilities from the system level using NASA's deferred maintenance parametric estimating method.
- To provide a facility performance metric which can be compared to, and trended against, other commonly used facility metrics.

NASA DM Estimate

(Includes 1.85% Engineer News Record inflation rate)

- Agency DM increased12% from $2.03B to $2.27B
  - Agency DM estimate is outgrowing inflation by about 10% annually
  - It remains approximately 10% of the Agency CRV
  - Active sites increased 8% from $1.64 B to $1.78 B
  - Inactive sites increased 26% from $0.39 B to $0.49 B

The increase in DM for Inactive facilities is generally attributable to better accounting of those facilities within the model

NASA Facilities Condition Index

- FCI remains at 3.6.
  - Active Facilities 3.7
  - Inactive Facilities 3.2
  - R&D facilities - 3.7
  - Mission Operations facilities - 3.9
  - Shuttle Related Facilities - 3.4
  - Low value and remote sites- 2.0 overall - 3.8 (active) 1.0 (inactive)

These ratings are too low for important facilities, because the potential exists that missions and programs may be impacted by the facility condition.

NASA Systems Condition Index

- Only notable increases in the system DM estimate were in the electrical and HVAC systems.
  - Electrical SCI remains at 3.3
    - DM estimate increased $0.06B to $0.81B
  - HVAC SCI decreased 0.1 to 3.4
    - DM estimate increased $0.13B to $0.34B.
- Program Support Equipment SCI decreased 0.2 to 3.8 as a result of clarification of assessment guidance

Electrical system continues to be 2x DM estimate of the next highest system, structure.

FY03 Results

Line Name	FY03 DM Total ($B)	FCI	Active DM ($B)	Active FCI	Inactive DM ($B)	Inactive FCI
Ames Research Center Total	$0.30	3.7	$0.14	3.8	$0.16	3.4
Dryden Flight Research Center Total	$0.01	4.2	$0.01	4.2	$0.00	3.7
Glenn Research Center Total	$0.29	3.6	$0.14	3.7	$0.16	2.3
Langley Research Center	$0.15	3.7	$0.12	3.7	$0.03	3.2
Code R (Aerospace Research)	**$0.76**	**3.7**	**$0.41**	**3.8**	**$0.34**	**3.2**
Goddard Space Flight Center Total	$0.09	4.1	$0.06	4.1	$0.03	2.5
Code Y (Earth Science)	**$0.09**	**4.1**	**$0.06**	**4.1**	**$0.03**	**2.5**
Jet Propulsion Laboratory Total	$0.09	4.0	$0.05	4.0	$0.03	2.7
Code S (Astrobiology & Space Research / Science)	**$0.09**	**4.0**	**$0.05**	**4.0**	**$0.03**	**2.7**
Johnson Space Center Total	$0.14	3.6	$0.14	3.6	$0.00	2.4
Kennedy Space Center Total	$0.85	3.3	$0.84	3.3	$0.01	3.4
Marshall Space Center Total	$0.23	3.6	$0.18	3.7	$0.05	3.1
Stennis Space Center Total	$0.12	3.5	$0.10	3.6	$0.01	3.2
Code M (Human Exploration & Development)	**$1.34**	**3.5**	**$1.26**	**3.5**	**$0.08**	**3.1**
NASA TOTAL	**$2.27**	**3.6**	**$1.78**	**3.7**	**$0.49**	**3.2**

FY02 to FY03 Comparison

Line Name	FY02 DM ($M)	FY03 DM($M)	Delta DM ($M)	% Change	FY02 FCI	FY03 FCI	Delta FCI
Ames Research Center Total	$230.05	$303.07	$73.02	31.74%	3.8	3.7	-0.1
Dryden Flight Research Center Total	$8.32	$7.42	-$0.90	-10.78%	4.1	4.2	0.1
Glenn Research Center Total	$270.62	$292.12	$21.50	7.94%	3.6	3.6	0.0
Langley Research Center Total	$288.14	$153.17	-$134.97	-46.84%	3.7	3.7	0.0
Code R (Aerospace Research)	**$797.12**	**$755.78**	**-$41.34**	**-5.19%**	**3.7**	**3.7**	**0.0**
Goddard Space Flight Center Total	$95.06	$91.29	-$3.77	-3.97%	3.9	4.1	0.2
Code Y (Earth Science)	**$95.06**	**$91.29**	**-$3.77**	**-3.97%**	**3.9**	**4.1**	**0.2**
Jet Propulsion Laboratory Total	$51.03	$86.35	$35.32	69.21%	4.1	4.0	-0.1
Code S (Astrobiology and Space Research/ Science)	**$51.03**	**$86.35**	**$35.32**	**69.21%**	**4.1**	**4.0**	**-0.1**
Johnson Space Center Total	$120.85	$136.33	$15.48	12.81%	3.5	3.6	0.1
Kennedy Space Center Total	$506.50	$850.13	$343.63	67.84%	3.3	3.3	0.0
Marshall Space Flight Center Total	$173.74	$233.50	$59.76	34.40%	3.9	3.6	-0.3
Stennis Space Center Total	$281.92	$115.08	-$166.84	-59.18%	3.1	3.5	0.4
Code M (Human Exploration and Development of Space)	**$1,083.02**	**$1,335.03**	**$252.01**	**23.27%**	**3.5**	**3.5**	**0.0**
NASA Total	**$2,026.23**	**$2,268.44**	**$242.21**	**11.95%**	**3.6**	**3.6**	**0.0**

Significant Differences

(Defined in SOW as 20% DM - .5 FCI)

- 18 of the 64 sites assessed had significant differences from last year:
  - 12 had significant changes due to ratings changes in no more than four facilities, or one system;
  - 3 had CRVs that were not generated on inactive facilities in the FY02 assessment;
  - 4 were low density sites where the change in a single facility could greatly impact the DM estimate or the FCI for a facility;
  - At 5 sites the decrease in the DM estimate and the increase the FCI was *directly attributable to a specific maintenance effort*.

All significant changes in DM and FCI were readily explainable

Impact of Facilities with CRV over $100M

- 34 facilities – 28% of CRV and 44% of FY03 DM estimate.
- A single rating change can change the DM estimate or the FCI for an the entire site.
  - VAB (CRV $883M) is 18% of the Kennedy CRV. Almost 50% of the Kennedy DM estimate.

It is critical that Centers' understand the impact of these facilities on their maintenance cost

Conclusions

- NASA's facilities are in good to fair condition with R&D & operations facilities generally in better condition than other facilities
  - Ratings range between *normally* function as intended and *occasionally are unable to function as intended,*
  - Too low for critical facilities because the potential exists that missions and programs may be impacted.
- The DM estimate outpacing inflation by 10%

NASA should develop a list of critical R&D and operational facilities to help prioritize maintenance funding.

Conclusions

(Electrical System)

- The lowest system condition assessment and the highest DM value.
  - These systems may not function as intended with a consistency required by NASA, especially within R&D and operational facilities.
  - Assessors depreciated over 27% of the electrical system ratings because a majority of the system was excessively old.

NASA should consider making the electrical systems its highest maintenance priority.

Conclusions
(Real Property Inventory)

- The single largest RPI issue is the misclassification of facilities.
  - Leads to incorrect CRV and UM
  - Within the model it leads to incorrect System CRV %
  - Results in DM estimate that may not truly reflect the status of the facilities on the ground

NASA should develop a guidebook on the classification of facilities similar to the one used by DOD.

Recommendations
(Highlights)

- NASA should address its critical weakness, its aging electrical system, by seeking special funding outside the normal budgeting process.
- Special attention should be given to facilities with a CRV over $100M.
  - After electrical systems, priority of repair/renewal if mission critical.
  - NASA should develop a photographic journal for all the facilities over $100 million to record and demonstrate the condition of these facilities.

Recommendations
(Highlights)

- Centralize the maintenance funding for some critical systems and facilities.
- Seek relief from the cost of maintaining some of its $2 billion worth of inactive facilities (DM value $.49 billion) through an active demolition program or other methods of facility disposal.

Recommendations
(Highlights)

- Perform a critical infrastructure review to determine "critical infrastructure" at each Center and for NASA as a whole to help prioritize maintenance funding.
- Consider tracking maintenance dollars by DM system.
- Populate the database's "program" table to help prioritize maintenance funding.